REMARKS

Claims 1-8 were pending in the present application. Claim 9 is newly added. Thus, upon entry of the present application, claims 1-9 will be pending.

In the Final Action, claims 1 and 2 were rejected under 35 U.S.C. §102(b) as being anticipated by the article entitled "Transparent silica gel-PMMA composites," Pope, E.J.A. et al., J. Mater. Res. Vol. 4, No. 4, Jul/Aug 1989. ("Pope") Claim 4 has been rejected under 35 U.S.C. §102(b) as being anticipated by Pope, as evidenced by United States Patent No. 6,146,801, to Ichikawa et al. Applicants respectfully traverse. Claim 1 is independent.

Claim 1 recites a porous nano material polymer composite, comprising nano silica particles comprising nanometer order holes, and a polymerized monomer in the nanometer order holes. The monomer is impregnated into the nanometer order holes and polymerized in the presence of a supercritical carbon dioxide fluid.

The Final Action acknowledges that Pope is silent with respect to supercritical carbon dioxide fluid, which is recited in claim 1. The polymerization of the claimed monomer in the presence of the super critical carbon dioxide results in an important structural difference between the composite of claim 1, and that of Pope. In Pope, the methylmethacrylate (MMA) is impregnated into the silica by "simple immersion" of the silica in a purified MMA solution, with 2% benzoyl peroxide (p. 1019, para. B). By contrast, supercritical carbon dioxide has a much lower surface tension than the conventional solvent and MMA monomer. This allows the monomer to impregnate into the nanopores of the silica much more easily, and results in a vastly improved structure over what is disclosed in Pope. Ichikawa is merely relied on to teach that the silane cited in the Final Action is hydrophobic, and fails to cure the above-described deficiency of Pope.

Therefore, claim 1 is patentable over Pope under 35 U.S.C. §102(b), as are claims 2 and 4, which depend therefrom. Applicants respectfully request that the

rejection of claims 1, 2, and 4 be withdrawn.

In the Final Action, claims 3 and 6-8 were been rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Pope in view of Zerda et al., Macromolecules 2003, 36, 1603-1608 ("Zerda"), and Ichikawa. Claim 3 is independent. Applicants respectfully traverse.

Claim 3 recites a method of manufacturing a porous nano material polymer composite, the method comprising impregnating a monomer into nanometer order holes of porous nanosilica particles in the presence of supercritical carbon dioxide fluid, and polymerizing the monomer.

As discussed above and acknowledged on p. 3 of the Final Action, Pope is silent with respect to the use of supercritical carbon dioxide. To cure this deficiency, the Final Action looks to Zerda.

As acknowledged on p. 3 of the Final Action, however, Zerda discloses "silicates" (emphasis added). In fact, Zerda discloses montmorillonite-based silicate (i.e., clays) as the concrete example of silicates (see p.1604 "Materials"). Silicates (i.e., clays) have completely different surfaces and physical characteristics than nanosilica particles, such as those required in claim 3. The use of supercritical carbon dioxide in Zerda is intended to overcome the very specific challenges that silicates present. Again, the Final Action acknowledges this fact, stating on p. 3 that supercritical carbon dioxide is used to overcome the unique problems with homogeneity that the viscosity of silicates presents. Therefore, it would not be obvious to combine the method of Zerda with the particles of Pope, since the two references deal with completely different structures. Figures 1-9 of the present specification illustrate the unexpected and unique advantages provided by the claimed method.

Therefore, claims 3 and 6-8 are patentable over the cited combination of Pope and Zerda under 35 U.S.C. §103(a). Applicant respectfully requests that the rejection

be withdrawn.

Claim 5 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Pope in view of Ichikawa. Claim 5 depends from claim 4, which in turn depends from claims 1 or 2. As discussed above with respect to claim 1, Pope fails to disclose or suggest nano silica. Ichikawa fails to cure this deficiency. Accordingly, claim 5 is patentable over Pope in view of Ichikawa for at least the reasons provided above with respect to claim 1. Applicants respectfully request that the rejection of claim 5 be withdrawn.

In view of the above, it is respectfully submitted that the present application is in condition for allowance. Such action is solicited.

Respectfully submitted,

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